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Radio protective properties of flaxseed and its lignan component-usefulness in ameliorating radiation pneumonopathy

Melpo Christofidou-Solomidou
University of Pennsylvania, USA

Usefulness of dietary supplements with potent antioxidant, anti-inflammatory and anti-carcinogenic properties are gaining increasing popularity. Dietary polyphenols such as curcumin, resveratrol, green tea catechins, and flaxseed lignans are currently tested in pre-clinical and clinical studies in the US and worldwide. Treatment of devastating lung conditions like cystic fibrosis, chronic obstructive pulmonary disease (COPD), adult respiratory distress syndrome (ARDS), radiation pneumonopathy, asthma and cancer is limited by adverse side effects of available treatment drugs. Nutritional supplementation of naturally occurring agents or their more potent synthetic counterparts is evaluated as adjuvant therapy to existing treatment regimens. A better understanding of their use, mechanism of action and effects will ultimately benefit patient care. Flaxseed (FS) and its lignan component (FLC) have known antioxidant properties. Their usefulness in thoracic X-ray radiation (XRT)-induced pneumonopathy was evaluated. We fed mice either FS-, FLC-supplemented or isocaloric control diets for 2-3 weeks prior to a single fraction (13.5Gy) of thoracic radiation. Lungs were evaluated at variable times up to 4 months for inflammation, oxidative lung injury and fibrosis. Oxidative lung damage shown by malondialdehyde (MDA) was significantly decreased post XRT by FS and FLC. Lung fibrosis, as evaluated by lung hydroxyl-proline content and confirmed by histology, was also decreased while mouse survival rates improved. Importantly, neither FS nor FLC protected lung tumors from responding to radiation treatment. Dietary FS or FLC are protective against radiation-induced lung disease and may be useful, and safe as adjuvant therapy in lung cancer treatment.

Biography

Christofidou-Solomidou completed her undergraduate studies at S.U.N.Y. at Stony Brook, NY and her Ph.D at the University of Bonn, Germany. After post-doctoral studies at Albany Medical College in NY and at the University of Pennsylvania in Philadelphia she joined the faculty at Penn's School of Medicine. She is an NIH-funded investigator and her research focus of involves the a) investigation of novel antioxidant approaches to acute and chronic lung disease; b) Chemoprevention of lung carcinogenesis and evaluation of anti carcinogenic effects of common botanicals. She has published more than 55 papers in high-profile journals and is serving on the editorial board of repute journals.

melpo@mail.med.upenn.edu